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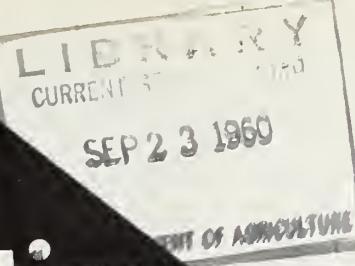
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OCTOBER 1960



From America's Abundance

Potential for Frozen Bread

A Better Way to Load Citrus Fruit

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE

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Volume 5, Number 10

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Cover page

The bright smile and sparkling eyes of our cover girl show how much America's food donations mean to the less fortunate peoples of the world. As part of the current Food-for-Peace program, the U.S. sends large quantities of surplus agricultural products abroad. It is our way of reinforcing the peace and promoting the well-being of all friendly peoples. For the complete Food-for-Peace story, see pages 8 and 9.

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FROZEN BREAD

its potential for reducing marketing costs

RESEARCH has found a way that would enable bakers to cut two cents a loaf from their bread prices—without changing their present profit position.

This reduction, researchers find, would be possible if bakers sold bread frozen instead of the present way, and if, at the same time, consumers would go along with the change in the product.

A preliminary report on marketing frozen bread, recently published by the Agricultural Marketing Service, figures it this way:

The route truckman is one of the most expensive links in the marketing chain for bread. Currently, the routeman delivers bread to the store and stocks the shelves. Often he calls back several times a day to see how the supply is holding up and to make sure that his brand has not been moved to a less favorable spot by a competing routeman.

If bakers converted to frozen bread, they could cut their delivery costs substantially, researchers believe. Frozen bread could move directly to frozen food distributors who in turn would deliver it along with their regular orders. The grocer could stock and maintain bread supplies himself as he now does for other frozen foods.

The possible use of frozen bread suggests other marketing advantages. For one thing, frozen bread wouldn't get stale as fast as fresh bread. Stale bread currently costs bakers as much as 4 percent of their total sales.

Also, customers would be less apt to squeeze the frozen loaves, and this would reduce the amount of handling damage.

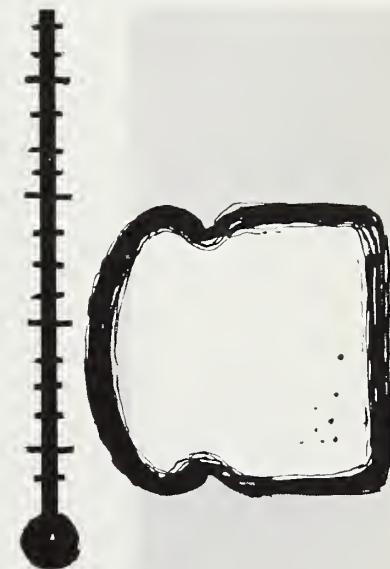
On the other hand, converting to frozen bread might well increase some costs. Everyone in the marketing chain—from the baker to the retailer—would need to adjust or add to his refrigeration equipment. And bakers would have the additional cost of the freezing operation. But the researchers feel these costs would be more than offset by the savings that would result from distributing frozen bread.

A reduction in the cost of distributing bread is particularly important because bread has one of the highest marketing margins of all agricultural products. The total margin from farmer to consumer for bread is about 16 cents for a 19-cent loaf.

But marketing costs will not be the only factor affecting the future of frozen bread. The consumer, the baker, and the wholesaler will have something to say about it.

Whether consumers will accept the new product is not yet known. Nor did the researchers ask industry representatives whether they would be willing to adopt the new distribution system and install the necessary freezer space.

The author, Robert V. Enochian, is an AMS economist stationed at USDA's Western Utilization Research Laboratory in Albany, Calif. For more details on the marketing potential of frozen bread, see AMS-395. Single copies may be obtained from Agricultural Marketing Service, USDA.





The Poultry Inspector

A TRAINED SPECIALIST

Classroom instruction and on-the-job training make him well qualified to inspect poultry, poultry products.

by Dr. Benjamin C. Pier

NEARLY everyone in today's poultry industry—from the farmer who depends on the inspector to approve healthy birds from his flock to the homemaker who looks to the Federal inspection stamp as a guarantee of safe food—has a stake in the work of the Federal poultry inspector.

To assure producers, processors, and consumers the best possible service under the Poultry Products Inspection Act, the U. S. Department of Agriculture's poultry inspection service focuses much attention on the Federal inspector.

Working quietly behind the scenes, he is the man who decides whether each bird processed at plants under Federal inspection is safe for food.

USDA's inspector-training program—an outgrowth of more than 25 years' experience with poultry inspection—includes both on-the-job training and classroom instruction.

New inspectors normally undergo six months to a year of on-the-job training which includes:

- Orientation training in the objectives of USDA and the poultry inspection program.
- Training at the plant in actual inspection of birds and the use of inspection criteria.

Dr. Pier is assistant to the director of the Poultry Division, AMS.

- Scheduled conferences to discuss with their instructors various aspects of the training.

- Assigned outside reading including copies of the Poultry Products Inspection Act, regulations, and other material related to the job.

- Supervisory training to prepare the new inspector for later supervisory positions.

The entire training period follows a plan of study set up by USDA. Training guides and instruction sheets prepared by the inspection service go to supervisory personnel at all plants where new inspectors receive training.

At the end of the on-the-job training period, station supervisors report on the performance of each new inspector.

Later, advanced training and refresher courses in the classroom are offered to the working inspectors. Usually held at times when it will not interfere with the inspectors' official duties, these schools run from one to two weeks. They are designed to keep the already qualified inspector informed of the latest developments in the industry and the latest changes in inspection methods.

The classroom program was used in a special way during 1958 to facilitate training the many new inspectors needed under the Poultry Products Inspection Act. Several months before the Act became

fully effective, USDA held two "train-the-trainers" schools. About 78 inspectors attended one or the other of these schools.

Later, in 1958, a series of one- and two-week schools led by trained supervisors drew 269 inspector-trainees.

By mid-December 1959, less than a year after the PPIA went into effect, 1,600 qualified inspectors were working at poultry slaughtering and further processing plants throughout the country. These included 850 new men trained during 1958 and 1959.

The program is further specialized to facilitate training of both veterinary and lay inspectors. The lay inspector trains for 12 months—twice as long as the veterinarian. Still, to accurately determine whether slaughtered birds are fit for food in some cases requires the advanced training of a degree in veterinary medicine.

Thus, when a poultry slaughtering plant uses only one inspector or when one inspector supervises several plants staffed with lay inspectors, he must be a veterinarian.

Trained lay inspectors often work on the inspection line at large poultry slaughtering plants. They may condemn carcasses with easily recognizable systemic disease conditions. But, those carcasses falling in a doubtful category must await examination by the veterinary inspector. In all questionable



About 79 percent of the poultry sold off farms in 1959 was Federally inspected.

cases, the veterinarian makes the condemnation decision.

Lay inspectors also perform most inspection tasks at convenience foods or further processing plants. Poultry comes to these plants after being certified as wholesome at the time of slaughter. The inspectors' work is primarily one of checking cleanliness and procedure at the plants and reinspection for condition of all components of poultry food products. If any highly technical problem arises, a veterinary supervisor makes the final decision.

Still another important part of the program is a continuing effort to find ways to improve inspector training. The newest project under test is a school at the University of Georgia at Athens that may run fulltime for about six months of the year. It was tried for the first time this summer.

Whether the benefits of the school will justify its cost and whether enough inspectors can attend to make the project feasible are the two main questions yet to be answered. If proven practical, the school will offer advanced and refresher training to both lay and veterinary inspectors.

Through this comprehensive program of on-the-job and classroom training, improved day-to-day by the poultry inspection service, the Federal poultry inspector becomes a skilled specialist serving the poultry industry and the public.

At further-processing plant, inspector checks the quality of dough put in chicken pies.



USDA inspectors make bird-by-bird examinations of poultry carcasses. During training period, instructor gives new man helpful pointers on how to detect disease in chickens.



USDA inspection stamp must appear on shipping container of inspected poultry. It may also be placed on giblet wrap.

mechanical sampling of COTTON

by Maurice Cooper

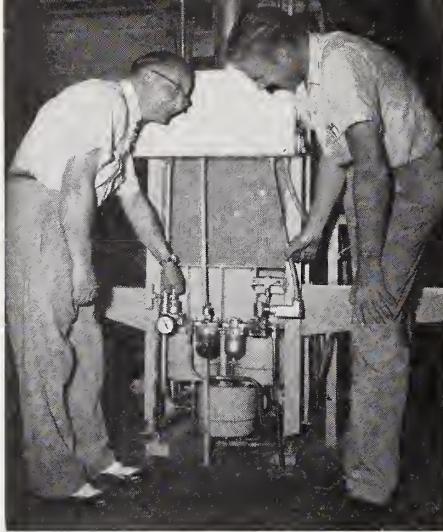
WITHIN its short five-year history, mechanical sampling of U. S. cotton has become an important practice in two of the major cotton areas in this country.

The vast majority of the machines in use are in large-volume gins owned cooperatively by farmers in California and Texas. Most of the mechanical samplers have been installed within the last year or so.

Mechanical sampling, developed by the U. S. Department of Agriculture, is designed to overcome certain shortcomings of the traditional method of cutting samples. Hand-cut samples come from a limited portion of the outside of the bale, leave a ragged bale covering, and subject the bales to excessive surface contamination.

The author is an agricultural economist in the Marketing Economics Research Division of AMS. He is senior author of the recently published marketing research report, "Mechanical Sampling of Cotton." Co-authors are J. D. Campbell of the Marketing Division, Farmer Cooperative Service, and D. L. Fritchard, also of the Marketing Economics Research Division of AMS.

Examining cotton sample turned out by machine.



Approximately 153 cotton gins in United States are equipped with automatic sampling machines.

Mechanical sampling, which draws the cotton from throughout the bale during the ginning operation, reduces the need for cutting into the cotton once it has been baled.

According to farmers, ginners, and dealers surveyed by the Agricultural Marketing Service, mechanical samplers have several advantages:

- They provide samples which more nearly represent the entire contents of a bale.
- They result in fewer or no cuts in the bale cover.
- They take less time for sampling.
- Dimensions of the samples are more nearly uniform.
- Mechanical samples use less cotton.
- It takes less time to class mechanical samples.
- And, finally, mechanical samples are preferred by buyers.

As was to be expected, not everyone surveyed was equally happy with mechanical sampling. The very qualities cited in praise of the mechanical sampler by some operators were sometimes listed as disadvantages by others. Often enough, the problems of mechanical sampling were the result of inexperience of the gin operators.

But even though many of the complaints may be discounted because of lack of experience by the

operators, the marketing research specialists feel mechanical samplers pose certain problems which have not as yet been solved.

One of the most important of these is the cost of mechanical sampling. In 1958 the estimated cost per sample in most California gins ranged from 16 to 22 cents depending largely on the number of bales ginned and sampled during the year. This was with small, two-sample equipment. Though the cost per bale was higher when using larger, three-sample machines, costs per sample were lower. They then ran from 12 to 18 cents per sample. Comparable costs for cut samples ranged from 13 to 20 cents.

But there is much more to the cost picture than these comparisons indicate, particularly for smaller gins. For example, the figures cited were based on gin volumes of 4,000 to 9,000 bales a year—two or more times greater than the national average. Obviously, sampling costs per bale would rise as the volume decreased.

The complicated nature of the mechanical samplers has somewhat limited their usefulness to date. The ginner must take considerable care in adjusting and checking the machine if satisfactory samples are to be obtained. And if the machine is allowed to skip bales or the samples are too small or otherwise unacceptable, the ginner and warehouseman are right back where they were, with cut samples and ragged bale covers.

Another hindrance to mechanical sampling is the long-standing domestic practice of taking new samples almost every time the average bale is sold, and often when it is offered but not actually sold.

Finally, some mechanical samplers do not always get subsamples from the thin outer portion of the bale from which fresh samples are cut.

Marketing researchers feel these limitations can, to some extent, be overcome with the development of simpler and less expensive devices.



REPORTING AGRICULTURAL PRICES

by Roger F. Hale and Ronald E. Johnson



PRICES the farmer receives for his products obviously have much to do with the size of his income. But the prices he has to pay for things have just as much to do with where he stands in the cost-price squeeze.

Making up-to-date information available regularly every month on these subjects is the job of the monthly report *Agricultural Prices*. It summarizes what has happened during the previous month to average prices farmers received for agricultural products and average prices they paid for a broad selection of items from the thousands of things they buy. It is the latest chapter of agricultural price measurements, summarizing the effect of changes in economic supply and de-

mand factors on the prices of things sold by and to farmers in their local markets.

The report's hundreds of estimates relate to average prices by States and for the country as a whole, rather than to quotations for a specific grade at a specific point. They apply mostly to the prices received and paid on the 15th of the month.

Daily changes in the price of 210-pound No. 1 barrows and gilts at terminal markets or at an interior packing plant will help the farmer decide when to sell his spring pigs. But the average price he actually gets for all the hogs he sells, including sows and boars, will be more important in determining his total farm income. And whether these average prices are low or high in real terms depends to a large extent on their relationship to prices paid for the myriad of commodities and services he must buy for his family and business.

Changes in prices of items farmers buy are a primary determinant accounting for changes in the parity prices of about 180 farm products.

The information on prices received by farmers is supplied by 9,000 voluntary reporters (mostly buyers) throughout the United States. Not all of them report on every single item, but they report on the commodities sold by farmers in their own areas. This means they cover the broad field of products sold by farmers the country over. In addition, data come from marketing organizations, key dealers, and others who are in a position to know what is going on in their communities.

Information on prices farmers

pay is supplied in much the same way by a group of voluntary dealers in commodities bought by farmers. For prices paid, the total number of reporters runs in the neighborhood of 70,000. Managers of grocery stores in rural areas furnish information on grocery prices. Clothing merchants report on prices paid by farmers for clothing. Farm equipment dealers, automobile dealers, feed dealers, fertilizer dealers, and others report on prices paid for their products.

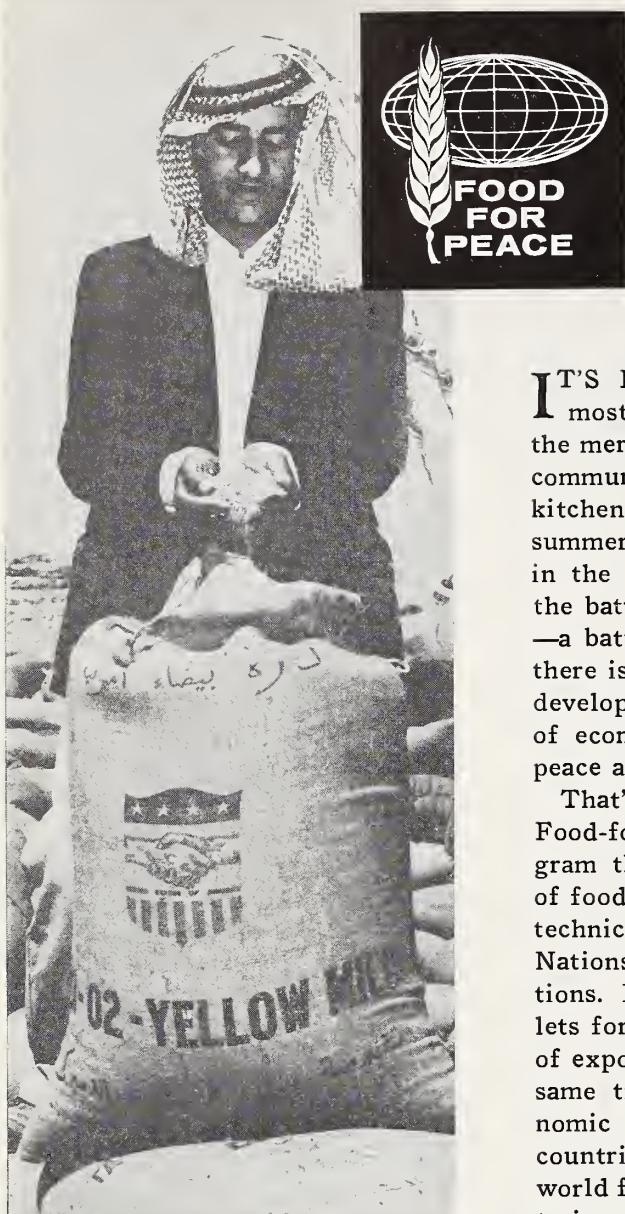
These reports are sent to the 43 State statisticians of the Agricultural Estimates Division and in some cases directly to Washington.

In either case the data are tabulated, summarized, and recommendations made by the State statisticians.

Then the final estimates are made by the staff in Washington which is constantly watching developments in the price field.

The *Agricultural Prices* report gives the farmer a factual picture of where he has been pricewise to help him with the short- and long-term planning of his production and marketing program. Parity prices, while related directly to price support programs and in some instances marketing agreement programs, are an almost universal consideration in the administrative decisions affecting many forms of farm aid by the Federal Government. And the parity ratio (the ratio of the Index of Prices Received by Farmers to the Index of Prices Paid by Farmers, Including Interest, Taxes, and Farm Wage Rates) measures changes in the per unit purchasing power of products sold by farmers in terms of things they buy.

Roger F. Hale is Head of the Prices Paid Section, Agricultural Price Statistics Branch, Agricultural Estimates Division, AMS. Ronald E. Johnson is a member of his staff.



United States sends Jordan high-protein feed to help preserve flocks decimated by drought.

IT'S FITTING that one of the most widely observed debates on the merits of free enterprise versus communism took place in a model kitchen at the Moscow Fair last summer. For, broadly speaking, it's in the kitchens of the world that the battle of peace is being fought—a battle that can only be won if there is enough food to enable less developed Nations to make the kind of economic progress that fosters peace and stability.

That's the concept behind the Food-for-Peace program—a program that calls for broad sharing of food, agricultural resources, and technical know-how by the "have" Nations with the "have not" Nations. By providing expanded outlets for the agricultural abundance of exporting countries while at the same time strengthening the economic development of recipient countries, this greater sharing of world food supplies is both humanitarian and practical.

Of course, food and peace have

From America

by Clarence Miller,

been linked in the minds of Americans since the start of the first world war. The present broad Food-for-Peace concept was announced by the President in January 1959.

In a message to Congress, he said, "I am setting steps in motion to explore anew with other surplus-producing Nations all practical means of utilizing the various agricultural surpluses of each in the interest of reinforcing peace and the well-being of friendly peoples throughout the world—in short, using food for peace."

Implementation of Food-for-Peace is largely through Public Law 480, the amended Agricultural Trade Development and Assistance Act of 1954. This legislation authorizes exports of surplus farm products outside the normal commercial channels of trade by permitting these special export activities:

- Sales of surplus commodities for foreign currencies.

Here, little girl in Tel Aviv, Israel, steps forward to accept food donation from U.S.



Earthquake victims in Chile anxiously await plane bringing food from United States.



Abundance

Secretary of Agriculture



- Donations to foreign governments in disaster emergencies.
- Donations to foreign needy persons on a continuing basis, after J. S. needy people have been provided for.
- Barter for strategic or other materials.
- Long-term dollar credits to enable friendly Nations to buy U. S. farm products.

The Food-for-Peace program thus is a supplement to the buying and selling for cash that accounts for most world distribution of farm products. Every effort is made to see that the program does not displace cash transactions. Instead, it provides a means whereby needy countries may obtain farm products when—because of dollar shortages—they lack the ability to buy in the cash market.

Other friendly exporting Nations have been invited to work with this country under the Food-for-Peace banner, to make full use of agricultural products in support of world peace and progress. Establishment in 1959 of a five-Nation Wheat Utilization Committee was a beginning. Members of the committee in addition to the U. S. are Argentina, Australia, Canada, and France. The Food and Agriculture Organization of the UN serves as observer-adviser.

The technical cooperation aspect of Food-for-Peace in the long view is undoubtedly as important to lasting peace and prosperity in the world as the immediate sharing of food abundances. Most of the underdeveloped areas are agrarian, and improvement in their agricul-

tural production at least at the same rate as the population gains is imperative.

American agriculture has always shared its "know-how." The best seeds, blooded livestock, farm practices—even household recipes—have been shared with neighbors. The land-grant college system encompassing research, teaching, and extension has been the root of U. S. agricultural growth. This technology is now being shared with all cooperating countries through the technical cooperation program of ICA.

The United States has a 45-year reputation as a good provider in war and a generous neighbor in peace. In 1914, the first major food relief effort of the United States was credited with averting starvation for 10 million people in Belgium and northern France. This first relief program was organized and directed by Herbert Hoover who later pointed out that "famine is the mother of anarchy."

When the United States entered World War I in 1917, the food program was expanded to help feed many of our allies as well as our Armed Forces and civilians, both at home and abroad. The need for food assistance didn't end with Armistice in 1918. Rather, the plight of some 200 million people in newly liberated and ex-enemy countries made even greater demands on U. S. farm production. It wasn't until mid-1923 that the post-war recovery in Europe and Russia was sufficient to permit withdrawal of American assistance.

The World War II food program,

which began with the passage of the Lend Lease Act in early 1941, was undoubtedly the greatest agricultural production, procurement, and distribution activity the world has ever known. As the war progressed, not only did the United States feed her own Armed Forces scattered all over the globe, but also helped fill needs of wartime allies—and, in fact, was the only source of supply for many friendly cash-paying foreign governments. The peak of food procurement came in 1945 when it reached the staggering total of \$2.6 billion, or an average of more than \$7 million a day.

And, just as after the previous war, when hostilities ceased in 1945, the need for U. S. food continued virtually unabated in the war-torn Nations of the world. The United States again administered a vast foreign relief program—this time in occupied areas of Europe and Asia. American food also was the backbone of relief programs operated by the United Nations. War and postwar shipments of agricultural commodities under Government programs from mid-1941 to mid-1949 totaled close to 70 million metric tons valued at \$13.4 billion.

The period from 1950 to 1954 brought a general slackening of relief food shipments with some increase in commercial demands resulting from economic recovery in Western Europe and Japan. The war in Korea in 1951-52 also brought a commercial demand for farm products.

Passage of Public Law 480 in
(continued on page 16)



the **MEAT PACKER** **and the P AND S ACT**

by Glenn G. Bierman

MORE than 2,300 meat packers are now operating under the jurisdiction of the Packers and Stockyards Act. All of these firms either purchase livestock outside the State or at posted stockyards, or they manufacture or prepare meat or meat food products for sale or shipment in interstate commerce.

For most of them, their contact with this Federal law, administered by the USDA's Agricultural Marketing Service, is confined to such requirements as filling out an annual report of operations, having their livestock scales tested regularly, and having their livestock buyers registered with the Secretary of Agriculture.

But the P&S Act is far from limited to such routine matters. It is designed to preserve free and open competition for livestock and for meats, so that each will bring its true value in the market place.

Congress enacted this law in 1921 in the belief that the livestock and meat industry is one of the key industries of the country and that its practices could seriously affect the entire agricultural economy as well as the consuming public.

This is as true today—if not more so—than when the Act was passed. Today, the meat packing industry buys more than 10 billion dollars

worth of livestock and poultry every year—approximately 35 percent of the total production of agriculture and in some States as high as 75 percent of farm and ranch production.

Meat and poultry are the key items in the diet of the consumer and represent nearly 25 percent of his budget for food. The consumer is more concerned day-to-day with the price, the quality, and the availability of meat and poultry than with any other product or group of products offered for sale to the public by any industry.

And so the effective enforcement of the P&S Act—which sets up a code of fair conduct for this industry—is of vital concern to all.

Basically, the Act, as it applies to meat packers, prohibits deception, unfairness, unjust discrimination or preference, apportioning of supplies, and other restrictive and collusive practices which serve to destroy or limit competition.

These prohibitions serve to protect not only the producer of livestock and the consumer of meat, but also the packer, from unfair practices of his competitors. They provide safeguards to his business freedom which permit him to succeed or fail in a free economy on the basis of his own merits.

The Act applies to the practices of a packer which affect others—the seller of livestock, the buyer of meat, and the packers' competitors.

Investigation of these practices is carried out by the Packers and Stockyards Division of AMS, principally through examination of the packers' annual reports and of their records (under the law, packers are required to keep records which will fully and correctly disclose all transactions involved in their business), through requests for information, and through the interviewing of packers and other persons.

The number of complaints and investigations handled by the P&S Division has increased several fold during the past few years. A substantial number of these complaints pertain to unfair, deceptive or discriminatory meat selling practices. One of the most common is misrepresentation of the product offered for sale, particularly its quality. In addition to deceiving customers, these practices frequently enable the dishonest firm to undersell its honest competitor.

Other complaints investigated include discriminatory promotional programs, restrictive sales agreements, false weighing, collusion in pricing livestock, and other deceptive livestock buying practices.

An increase in recent years in the number of packers failing to pay for livestock purchased has caused the P&S Division to give increasing attention to this problem.

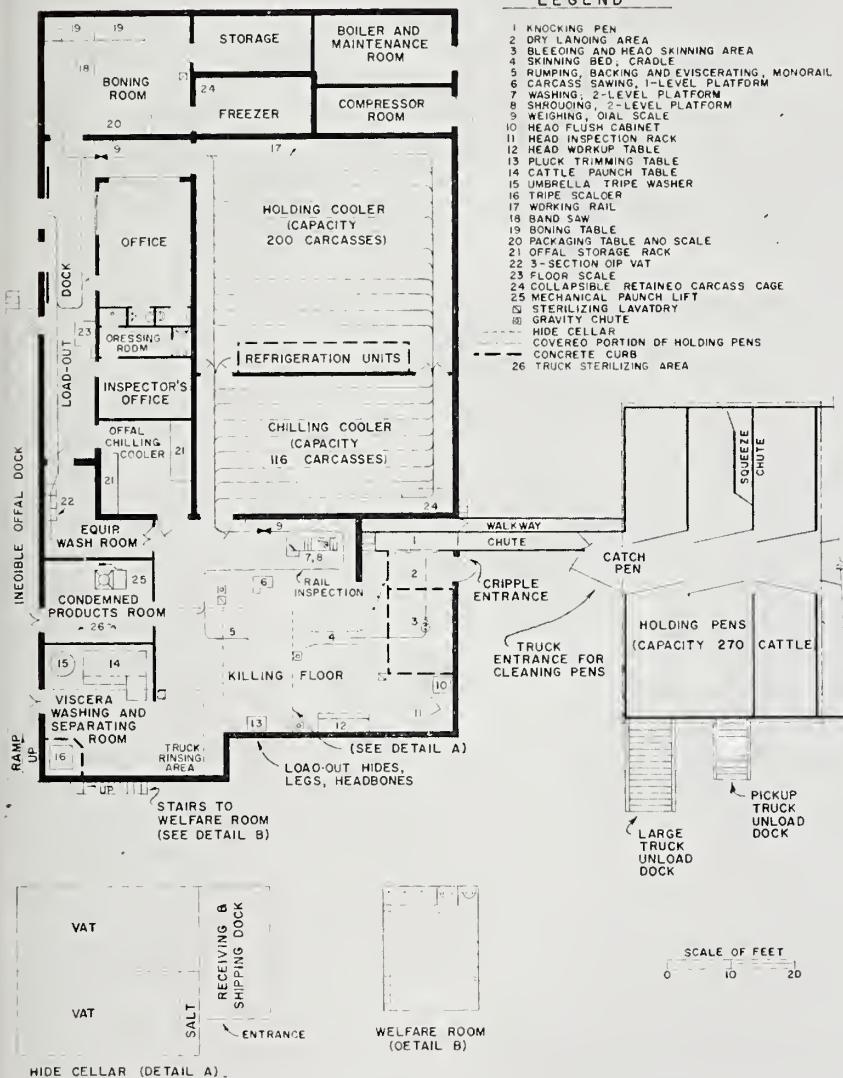
The meat packer, as well as the livestock seller, benefits from the Act's regulation of the livestock marketing industry. The law provides that all packers shall be permitted to compete for livestock supplies at posted markets. It requires accurate scales, honest weights, and adequate facilities at reasonable rates. In addition, agents may charge only their approved schedule of rates on file with USDA.

Under the Act every purchaser is entitled to a full and accurate accounting of his purchase. The Act further establishes a procedure under which a complaint may be filed with the Department for reparation against any stockyard company or registrant under the Act.

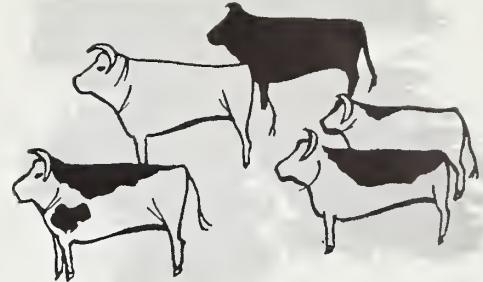
The author is a staff member of the Packers and Stockyards Division of AMS.

CATTLE SLAUGHTERING PLANTS

in the Southwest



A time-saving combination of layout and work methods for slaughtering plants is shown in a new report issued by AMS, "Cattle Slaughtering Plants in the Southwest—Methods, Equipment, and Facilities." Following the AMS plan, a plant slaughtering 100 cattle daily can reduce its costs 50 cents a head—or \$13,000 a year. Largest savings occur in the killing operation. Here, plan cuts costs from \$156 per 100 cattle to \$118.



HERE are a few pointers on how a cattle slaughtering plant can be made more efficient—both in design and work methods. They are recommended by AMS research specialists who recently published a report on improved operations for southwestern slaughtering plants.

- A horizontal revolving door permits easy movement of animals from the knocking pen (1) to the killing floor (2-9). Floor of knocking pen slopes for easy dumping of the animal onto the killing floor.

- Thirteen feet of rail over the bleeding and head skinning area (3) hold 6 large animals, or 8 medium animals, or 12 small animals.

- A cradle to hold the carcass during skinning helps cut the cost of the operation by more than \$4 per hundred cattle when compared with the pritch plate method.

- A two-level platform (8) cuts cost of shrouding almost in half by eliminating waste motion.

- Conveniently located sterilizing lavatories save workers' steps, increase productive time.

- Carcasses can be moved quickly from the killing floor to the adjacent chilling cooler. Overhead rail system in the chilling room provides 272 feet of rail space for storing carcasses.

- Carcasses move from the chilling cooler directly into the holding cooler. Twelve parallel overhead rails, each 36 feet long, provide 432 feet of storage rail.

- The refrigerated loading dock—part of the plant proper—connects directly with the holding cooler, boning room, and offal chilling cooler.



Federal-State inspector looks over box of corn.

ACREAGE GUIDES aid vegetable marketing

by James V. Fahey

The first of the new season's acreage marketing guides is now off the press.

Issued by the Agricultural Marketing Service of the U. S. Department of Agriculture, the guides assist growers in planning production and give marketing men a preview of what to expect during the months ahead.

The August guides are for winter potatoes and winter vegetables. They apply mainly to southern growers—those in Arizona, California, Florida, Louisiana, South Carolina, Texas, and Virginia.

For these States, USDA vegetable marketing specialists recommend that:

- Growers of winter potatoes boost their acreage 5 percent.
- Growers of winter vegetables cut their total acreage for fresh use by 6 percent.

Specifically, they suggest the following planting adjustments—*Decreases:*

Cabbage, 20 percent.

Carrots, 20 percent in Texas, 15 in California, no change in Arizona.

Lettuce, 15 percent in California, no change in other States.

Beets, 10 percent.

Celery, escarole, shallots, 5 percent.

Increases:

Spinach, 5 percent in Texas, no change in other States.

Green peppers, 5 percent.

Cauliflower, cucumbers, and kale, 10 percent.

Sweet corn and tomatoes, 50 percent.

No change is recommended for acreage of snap beans and broccoli.

Growers, however, are under no obligation to follow these acreage guides. Participation is entirely voluntary. But—the record shows that when producers go along with the guide patterns, they run into fewer marketing difficulties.

USDA acreage guides are the expert opinions of a wide variety of marketing specialists. These men follow the vegetable market all year long, then pool their information for the final estimates.

Recommendations are stated as percentage changes from the previous season—so each grower can easily apply the increase or decrease to his own acreage.

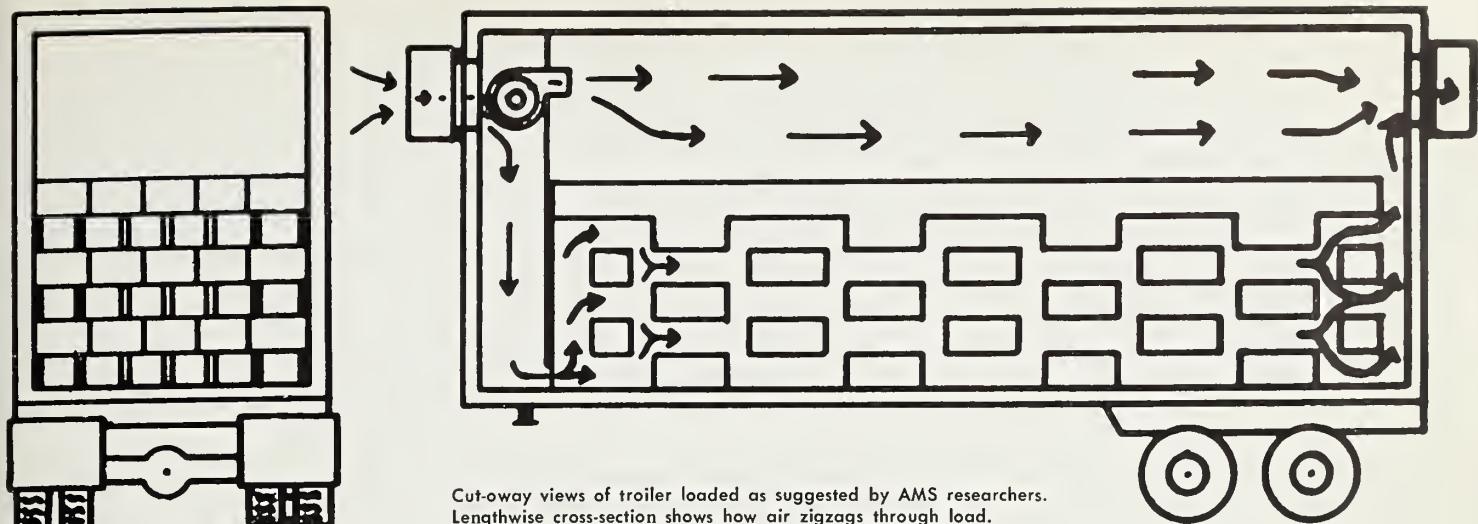
The program is based on the simple, sound premise that—given the best possible information—the grower will make intelligent decisions in his own best interest and the best interest of all the vegetable industry.

The guides for winter crops are the first of the new season. On Monday, November 7, USDA will issue its recommendations for acreage of spring vegetables, potatoes, and melons. In February, the guides will recommend acreage for summer and fall potatoes, vegetables, and summer melons, and for 1961 vegetables for commercial processing.

The author is a staff member of the Vegetable Branch, Fruit and Vegetable Division, AMS.



Acreage recommendation for sweet corn is up 50 percent over that of previous year. This means more plantings, more corn going to market.



Cut-away views of trailer loaded as suggested by AMS researchers. Lengthwise cross-section shows how air zigzags through load.

A BETTER WAY TO LOAD CITRUS

New method of loading permits easy airflow, keeps fruit at more desirable temperatures.

by Russell H. Hinds, Jr.

LOADING patterns do make a difference—in the amount of air that circulates through a trailer load of produce, in the amount of heat that's removed, and in the damage the containers sustain during transit.

All of these are problems for truckers moving farm produce to market.

Now, AMS transportation researchers have come up with a new way to stack fresh citrus packed in 4/5-bushel fiberboard containers—one that promises to move the fruit to market at more desirable temperatures.

Fruit shipped in corrugated fiberboard boxes create a special problem. When packed tight in the truck-trailer, the boxes allow little cooling during transit.

That's why AMS researchers centered their attention on fiberboard containers.

To beat the heat, they developed

a new stacking pattern that lets cool air zigzag its way through all parts of the load. The load itself has 21 air channels running from the front to the rear of the trailer. It is stabilized by crosswise boxes packed tight from sidewall to sidewall. These form every other layer of alternate stacks.

Containers are placed alternately crosswise and lengthwise in a bonded-block pattern. Between each lengthwise carton is a 2- to 3-inch air channel. Thus, in each stack, there are 5 air channels and 6 rows of lengthwise containers.

Air also circulates between the containers and the walls of the trailer and along connecting channels, both vertical and diagonal.

As the air moves lengthwise in the trailer, it passes over two boxes, then under two boxes, and so on through the load.

The top layer of each stack—whether lengthwise or crosswise—is always loaded solid. If this is not done, the circulating air will

follow the path of least resistance, settle downward through the load, and fail to reach many of the boxes.

The first stack against the bunker also is different from the other stacks. It is the key stack used to adapt the load to the length of the truck-trailer. More important, it provides the passage for the air to move to and from the ice bunker and all 21 longitudinal channels.

The trucker has his choice of four bunker-stack patterns.

- The first consists of six rows of boxes placed on end and topped by a solid layer of crosswise boxes.

- The second has lengthwise boxes spaced to form the channels and also lengthwise boxes loaded tightly from wall to wall.

- These two in combination make up the third type of bunker stack.

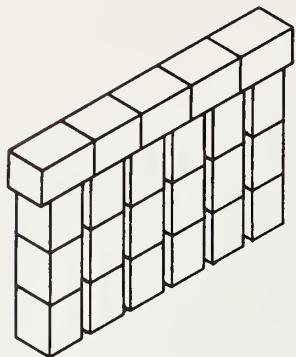
- And, finally, two stacks with lengthwise boxes both top and bottom combine to form the fourth pattern.

It's up to the trucker to select the bunker stack best suited to his particular situation. Regardless of the length of his trailer, the use of one of these patterns will just about fill his truck from front to rear.

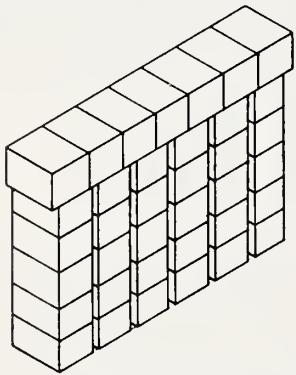
This means there's no longer any

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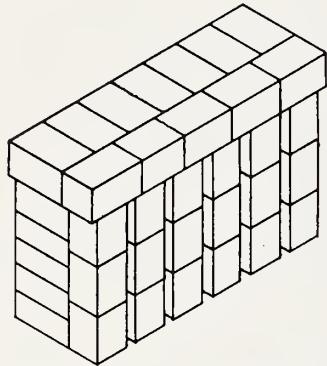
4 Types of Bunker Stacks



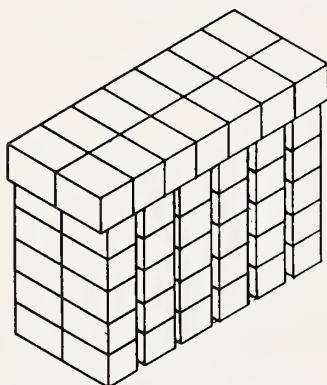
First plan has boxes on end and crosswise at top.



Lengthwise boxes form channels, also top stack.



Types 1 and 2 together form third possibility.



Two stacks of lengthwise boxes both top and bottom combine to form fourth stacking pattern.

need for the troublesome crosswise stack at the front or rear of the load—the one used to make the load come out evenly in relation to the length of the trailer. Also, there is now no obstruction to the air passages. They run the complete length of the trailer.

There was one problem, however, that plagued the researchers as well as the truckers. The load still shifted somewhat—both crosswise and toward the rear.

When the shift was crosswise, it closed some of the air channels at the rear. To keep these passages open and maintain air circulation, a small corrugated fiberboard spacer was inserted in the channels in the last stack. This did the trick. The boxes were held in alignment, and the air channels kept open.

A shift rearward also blocked air circulation in the last stack by shoving the boxes tightly against the doors. This was prevented by installing an inexpensive wooden gate.

Despite the use of spacers and air channels, the new stacking arrangement accommodates as many boxes as the conventional tight-stacked method. A few extra boxes placed on top of the load can generally offset any loss in the main body of the load.

During the tests, all of the trucks were able to carry their normal payload with proper weight distribution.

Over-the-road tests further pointed up the value of the new

stacking pattern. Air flowed through the channels at an average rate of 250 feet per minute. In the lower layers of the load, it moved even faster. And this was for both refrigerated and ventilated loads.

Temperature readings also met the test. Paired trucks moving under comparable conditions—except for the stacking patterns—were tested last April and May with outside air temperatures ranging from 60° to 90° F.

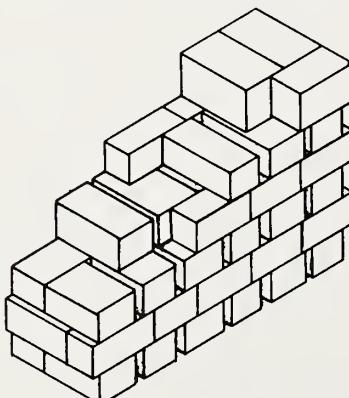
Fruit stacked according to the new airflow method started the trip to market at 80° F. but was reduced to 58° F. by the time it reached its destination. In the tight-stacked, conventional load, fruit averaging 79° F. at origin was reduced to only 68° F. at destination.

Both loads moved under a combination of venting and limited ice bunker-blower refrigeration.

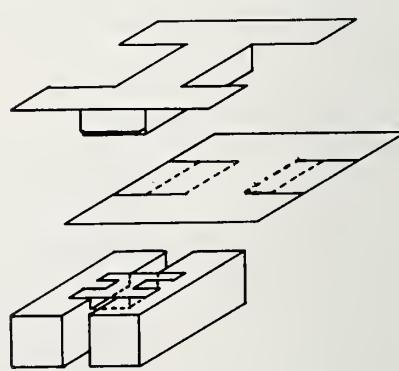
With heavy icing, bunker-blower refrigeration, and the new airflow stacking pattern, fruit in another test shipment was lowered from 79° F. to 52° F. en route.

This research is part of a series of studies being conducted in the design of new loading patterns for boxed fresh citrus. Additional studies will include patterns for wirebound boxes and other corrugated fiberboard containers.

Detailed drawings of the new stack pattern described in this article may be obtained from the Transportation and Facilities Research Division, AMS, USDA.

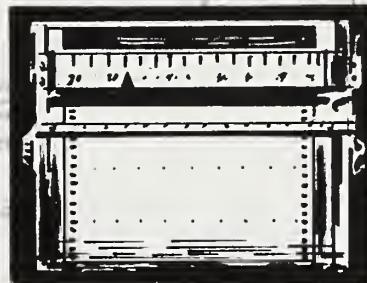


Detailed cross-section of odd-numbered stacks.



Fiberboard spacers help prevent lateral shifting.

NEW WEATHER ANALYSIS SYSTEM FOR POTATO STORAGES



by A. H. Bennett

SOME OF THE GUESSWORK has been taken out of storing potatoes in the Long Island area. Statistical data, compiled hour by hour for 7 full years, now give potato warehousemen a basis for anticipating outdoor temperature and humidity conditions.

And this takes much of the risk out of potato storage.

In the past, the control of inside storage temperature and humidity depended to a large extent on how well the builder and warehouse operator could anticipate the weather outside.

Recently, Agricultural Marketing Service researchers devised a statistical plan that makes predictions more accurate.

Based on official data recorded at the Suffolk County Air Force Base, Westhampton Beach, L. I., the new weather analysis system provides both wet and dry bulb

temperature and humidity readings. It includes data from July 1, 1951, through June 30, 1958.

With a little computation, statisticians are able to figure the average weekly temperature and humidity for the area. By plotting frequency distribution curves, they can see how these vary about the mean. Bar charts are used to show hourly changes.

For example, researchers have found that Long Island storage operators can expect 237 hours of below-40-degree temperature during November. Eighty-five of these probably will range between 30° and 35° F.

Similar data can be obtained for any month or week, for both temperature and humidity. Probability curves now answer that old question, "What's the weather going to be?"

In another, separate phase of the study, mathematical models were developed for predicting storage temperature at any time during the initial cooling period and for com-

puting—at any time—the moisture deficiency in the ventilating air.

These calculations take into account the amount of insulation in the storage facility, the rate of airflow, and the initial storage temperature. They are helpful in determining the proper fan and motor size for cooling and the capacity of the humidifier needed to provide moisture for the ventilating air.

Such control is important in storing late summer and fall potatoes in the Northeast. Proper storage conditions can reduce decay and shrinkage losses and bring a better looking, firmer, tastier potato to market.

Although this research study deals specifically with potatoes grown and stored in Long Island, it can be applied to other commodities and to other areas of the country. As such, it can benefit a broad segment of our agricultural community—farmers, warehousemen, retailers—and the consuming public as well.

The author is an agricultural engineer with the Transportation and Facilities Research Division of AMS. He is stationed in Athens, Ga.

OFFICIAL BUSINESS

The Changing Market

Shipping Florida Oranges

Shipper-growers of polyethylene packaged Florida oranges can give the consumer a better product by adding a preservative to the hydro-cooling water when the oranges are precooled.

That's the conclusion of AMS marketing researchers in a recent progress report on the market quality of Florida oranges shipped to New York in polyethylene bags.

Buyers like oranges packaged at growing areas in poly bags because the fruit shrinks less than when packaged in mesh bags.

The marketing researchers recommend that a concentration of 0.1 percent o-phenylphenate be maintained throughout the hydrocooling process.

Fats and Oils for Paints

Farm-produced fats and oils have been losing ground to plastics in the manufacture of paints, varnishes, and lacquers.

AMS market economists report the per gallon use of fats and oils in these products dropped from about 2 pounds in 1940 to 1.2 pounds in 1959.

At the same time, plastics have increased their importance. Per gallon usage went from 0.3 to 1.3 pounds.

Over the past 20 years, total production of paints, varnishes, and lacquers has doubled. But total use of fats and oils has increased less than 20 percent.

The reason fats and oils have not kept their share of the market has been due mainly to a shift in the type of products manufactured.

The postwar era has witnessed a growing demand for paint products suited to the "do-it-yourself" home owner. The new convenience products, for the most part, contain little or no drying oil.

A continued shift to these synthetics and a probable decline in the amount of paints and varnishes made entirely with oil will further decrease fats and oils share of the market.

To find other uses for these agricultural products, the U. S. Department of Agriculture and the paint industry are conducting a joint research program to develop emulsion-type paints from linseed oil.

Also, USDA has recently initiated research to evaluate market potentials for various fats and oils materials and derivatives in coatings and other uses.

From America's Abundance *(continued from page 9)*

1954 stimulated movement of farm products to dollar-short countries and liberalized donation programs. During fiscal years 1954 through 1960 donations totaled about \$1.4 billion—most of that distributed abroad by U. S. voluntary church and welfare agencies in the "People to People" relief program.

In the same period, sales for foreign currency amounted to some \$5 billion, based on world market

prices. The value of barter exports in the first 5 years of the program totaled over \$1 billion dollars, involving wheat, cotton, corn, and other U. S. surplus commodities.

Thus, Food-for-Peace is a reality—a dynamic, active expression of America's desire for world peace and her willingness to take the lead in creating an economic climate that will nurture peaceful progress and prosperity.

Handling Tomatoes After a Freeze

The tomato farmer may be able to rescue a larger proportion of his crop after a freeze than he now thinks possible—if he knows how to go about it.

AMS researchers have developed a few general rules to help the farmer judge what part of his crop he can ship.

Tomatoes should not be shipped if—

- They show such symptoms of freezing injury as water-soaked areas, pebbly or collapsed tissues, yellow spot, or a water-soaked condition in stem scar.

- They have been subjected to an average daily temperature below 50° F. for a week.

Marketing researchers suggest the harvest be delayed for a day after a freeze, when possible. They also recommend that tomatoes then be held in the packing house for 1 to 3 days before grading. Both steps give latent freeze and chilling damage a chance to show up.